



Office of Civilian Radioactive Waste Management

**Identification of Transportation
SNF Data & Information Needs**

RW/EM TRANSPORTATION MEETING

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Transportation System Design Support Documentation Data Needs

Data desired that describes and supports work done by EM to define the system envisioned for the DOE-SNF/HLW transport mission.

System descriptions

- Concept designs**
- Drawings**
- Concept of operations**
- Design Analysis and assumptions**
- SNF and HLW characteristics data**
- Design Specifications**
- Procurement information (EOI) solicitation and feedback**
- QA data (as appropriate)**
- List of open issues or unresolved problems, TBD's etc.**

Data would be use as a point of departure for future OCRWM efforts to develop suitable transportation system capabilities.

Basis for Data Need

- Cask Acquisition options for DOE SNF
 - Acquire specific casks for DOE SNF
 - Include DOE SNF in cask procurement
 - Vendors may modify existing designs, and NRC certificates of compliance
 - For either option-
 - Sufficient information about the SNF and canisters will be needed for successful NRC certification

Basis for Data Need (Continued)

- NRC Certificate of Compliance data includes such things as;
 - Physical descriptions of SNF and Canisters
 - configurations, dimensions, materials, etc.
 - Radiological safety data for
 - containment, shielding and criticality analysis

Data Needs

- The transportation SNF data list is intended to be comprehensive
- It is presented for discussion
- It is comprised of the data that will be needed for NRC certification of casks for DOE-SNF

Data Needs (Continued)

- **The SNF Data Needed Are Presented in Three Lists**
 - Data for Bare and Canistered SNF
 - Data for Individual SNF assemblies that is needed if SNF is canistered or uncanistered
 - Data for Canisters
 - This data is additional to SNF data
 - Data for Damaged SNF
 - Needed for any and all damaged fuel

Data Needs List (Continued)

- **Data Needs for Bare and Canistered SNF**
 - SNF Type (e.g., BWR, PWR, MTR, TRIGA, N-Reactor)
 - Number of fuel rods or plates
 - Cladding material
 - Clad thickness
 - Maximum initial fuel pin pressure, p (temperature)
 - Overall SNF dimensions- initial conditions (envelope)
 - Overall SNF dimensions- as is conditions (envelope that accounts for bowing, twisting, etc.)
 - Active fuel length

Data Needs List (Continued)

- **Data Needs for Bare and Canistered SNF (continued)**
 - Initial fuel pellet diameter.
 - SNF rod or plate dimensions.
 - Specification of any control rods in assemblies.
 - SNF unit weight (envelope).
 - Identification and initial enrichment of fissile materials.
 - Details of spacers, tubes, and any hydrogenous materials in SNF of assembly hardware.
 - Identification of hazardous or reactive chemicals present.

Data Needs List (Continued)

- **Data Needs for Bare and Canistered SNF (continued)**
 - Maximum average burn-up.
 - Minimum cooling time.
 - Maximum specific power.
 - Maximum decay heat generation (at specified cooling time).
 - Maximum allowable clad temperature.

Data Needs List (Continued)

- **Data Needed for Canisters**

- Unique canister identification.
- Number of assemblies or SNF units in canister.
- Identification of SNF in canister.
- Information about draining, drying, and back-filling.
- Canister back-fill gas.
- Identification and characterization of non-fuel bearing contents.
- Maximum canister decay heat generation.
- Inventory of radioactive nuclides.
- Identify any corrosion products in canisters.

Data Needs List (Continued)

- **Data Needed for Canisters (Continued)**

- Canister design specifications and drawing(s)- For use in NRC certification process
 - Configuration details (canister and internal basket).
 - Outer dimensions.
 - Maximum loaded weight.
 - Internal dimensions (wall thickness, basket spacing, details of any flux traps, shield plugs).
 - Materials of construction.
 - Weld and other construction details.
 - Neutron absorber materials in basket.

Data Needs List (Continued)

- Data for Damaged SNF
 - Description or classification of damage (degree of cladding or assembly hardware damage).
 - Design detail of damaged SNF can including drawing for use in NRC certification process.
 - Specify sealed or unsealed can.
 - Identify any canisters with uncanned damaged SNF.
 - Identify any corrosion products.